

Forest Policy Themes and the Forest/Climate Change Nexus

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Scale of the CO₂e Challenge

- 2007 Output – 475 Million Metric tons of CO₂ equivalent gases (475 MMT CO₂e)
- 2020 Reduction Goal – 174 MMT CO₂e
- ARB Regulatory Reductions - ~70
- Remaining Goal - ~100
- Cost-effective market and government ‘smart investments’ , average investments will be needed



Key Forest Policy Issues

- State climate change policies influencing forestry are being developed in many different arenas
- California forests produce low-carbon products, are adding carbon, and can do more
- In-forest, in-products, and in-renewable energy climate benefits must all be considered
- Smart investments, not just average investments, are going to be needed from both governmental and private sources



Recent International Science

Three distinct forest-based themes

Intergovernmental Panel on Climate Change (IPCC) 2007
Report Working Groups

1. Physical science basis

- Tropical forests create weather, temperate forests are impacted by weather
- Forests grow (respire and sequester), stabilize, and rot

2. Impacts, adaptation and vulnerability

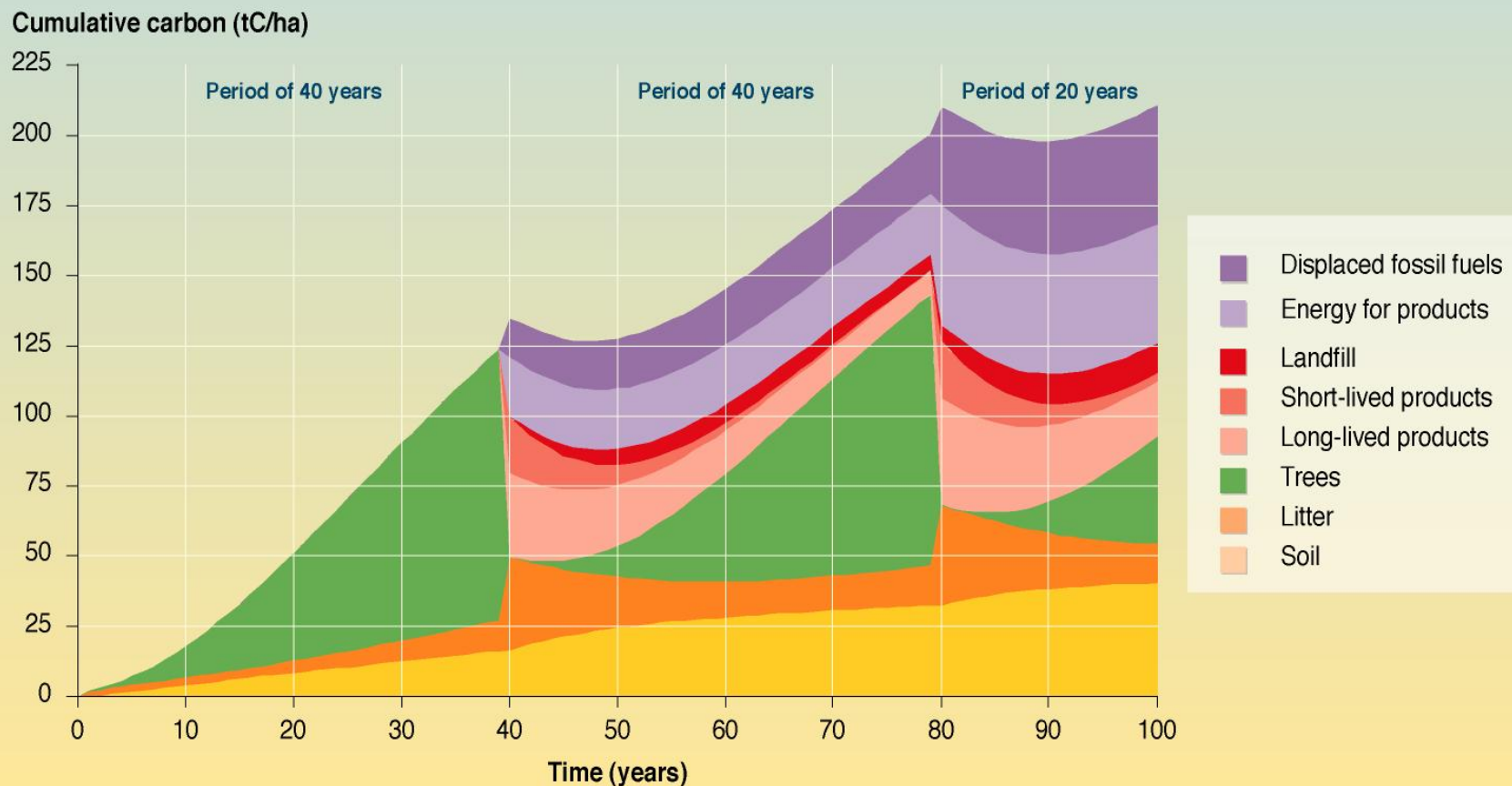
- Different species and stand structures are already driven by climatic variables that may change fairly rapidly

3. Mitigation of climate change

- Current forest baseline is more carbon/acre/yr since the 1980s -- with even more possible



Carbon balance from a hypothetical forest management project



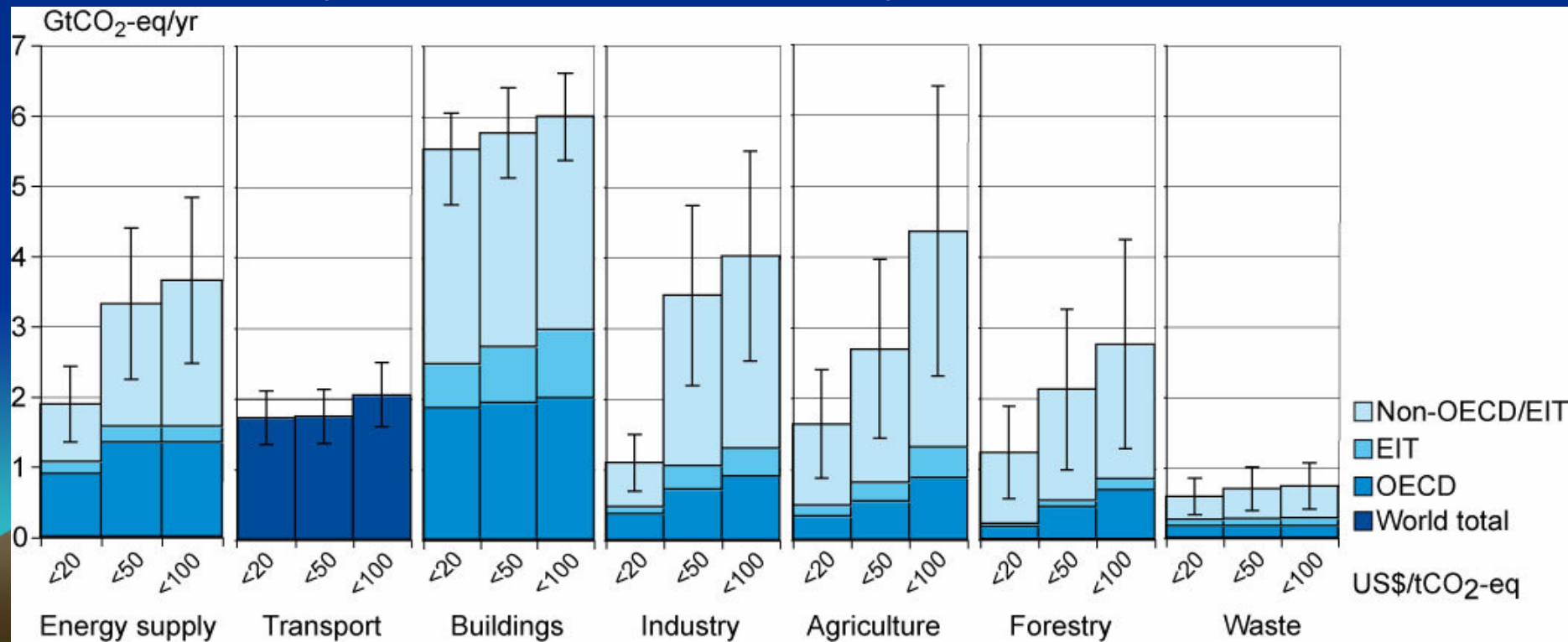
WG3 - FIGURE TS-6

1/3 in-forest, 1/3 in-products, 1/3 in energy conservation



Details, details, details – key points where forestry and forest products matter #1 buildings #2 low-carbon energy supply #3 in-forest sequestration

Note comparatively small size of 'OECD Forestry' at \$20/CO₂e ton www.ipcc.ch



Three Related Opportunities for Forests and Forest Products

1. In-forest

- net-new carbon sequestration via faster growth and less loss to fire, insects, wind, etc.

2. In-products

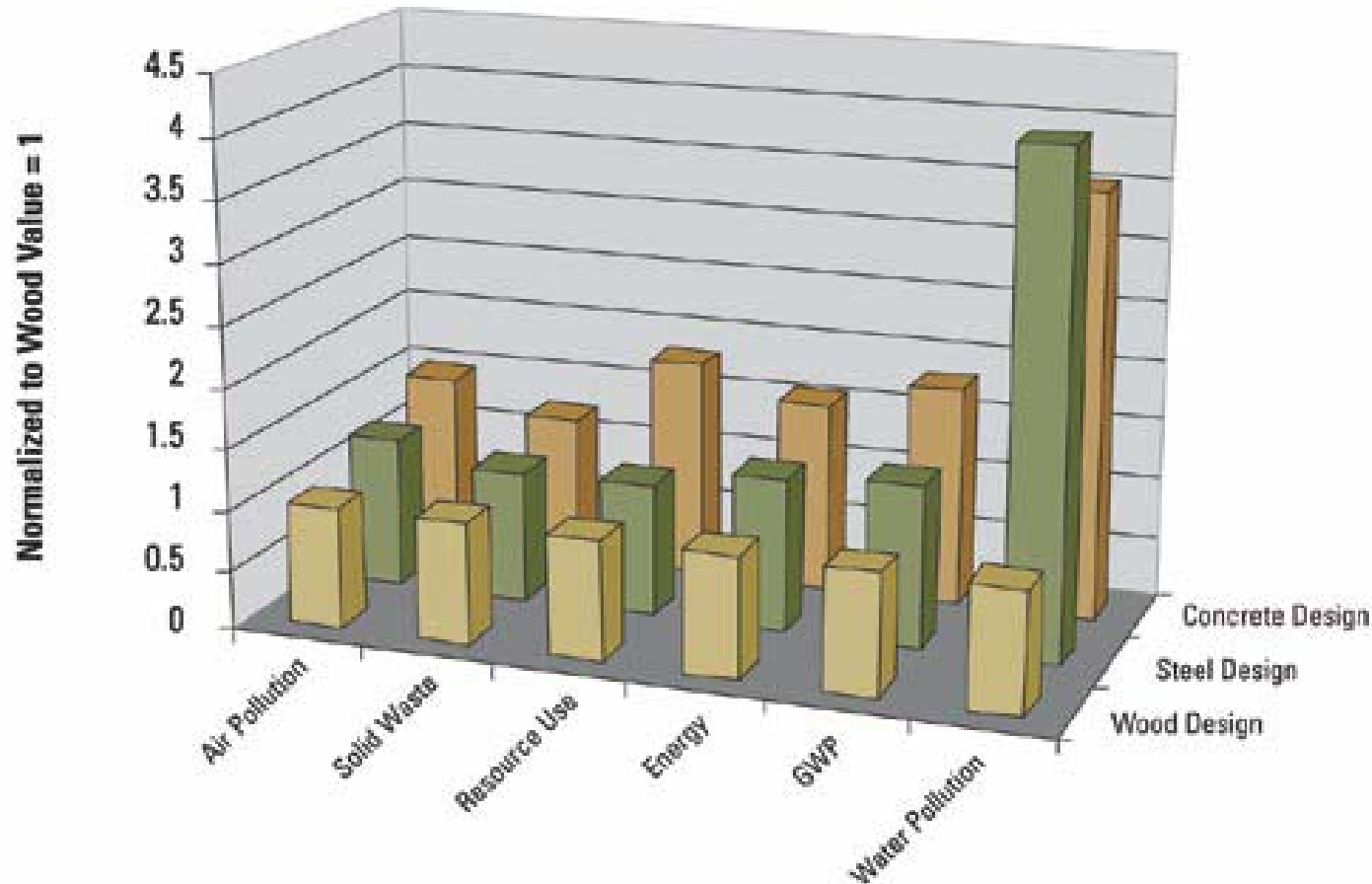
- increasing the use and lifespan of wood materials in buildings

3. In-renewable energy

- forest biomass for steam heat and electricity to meet the Renewable Portfolio Standard (RPS)



Wood design has many benefits over steel and concrete design in initial energy and lifetime energy use

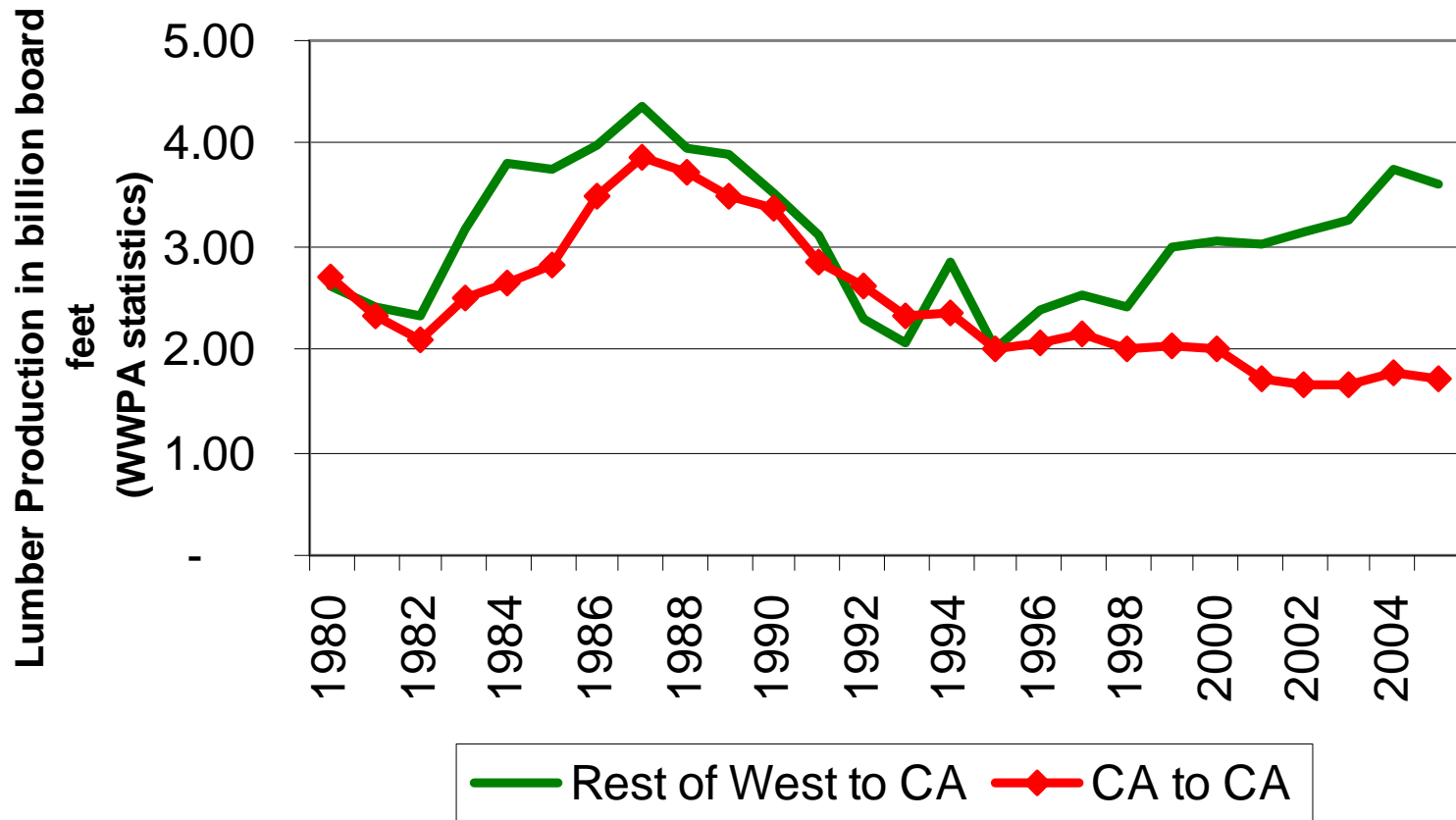


Embodied Effects Relative to the Wood Design across all Measures

Californians Use Lumber

But Mainly From Other States

Canadian imports not shown



What is need to get more forest-based climate benefits

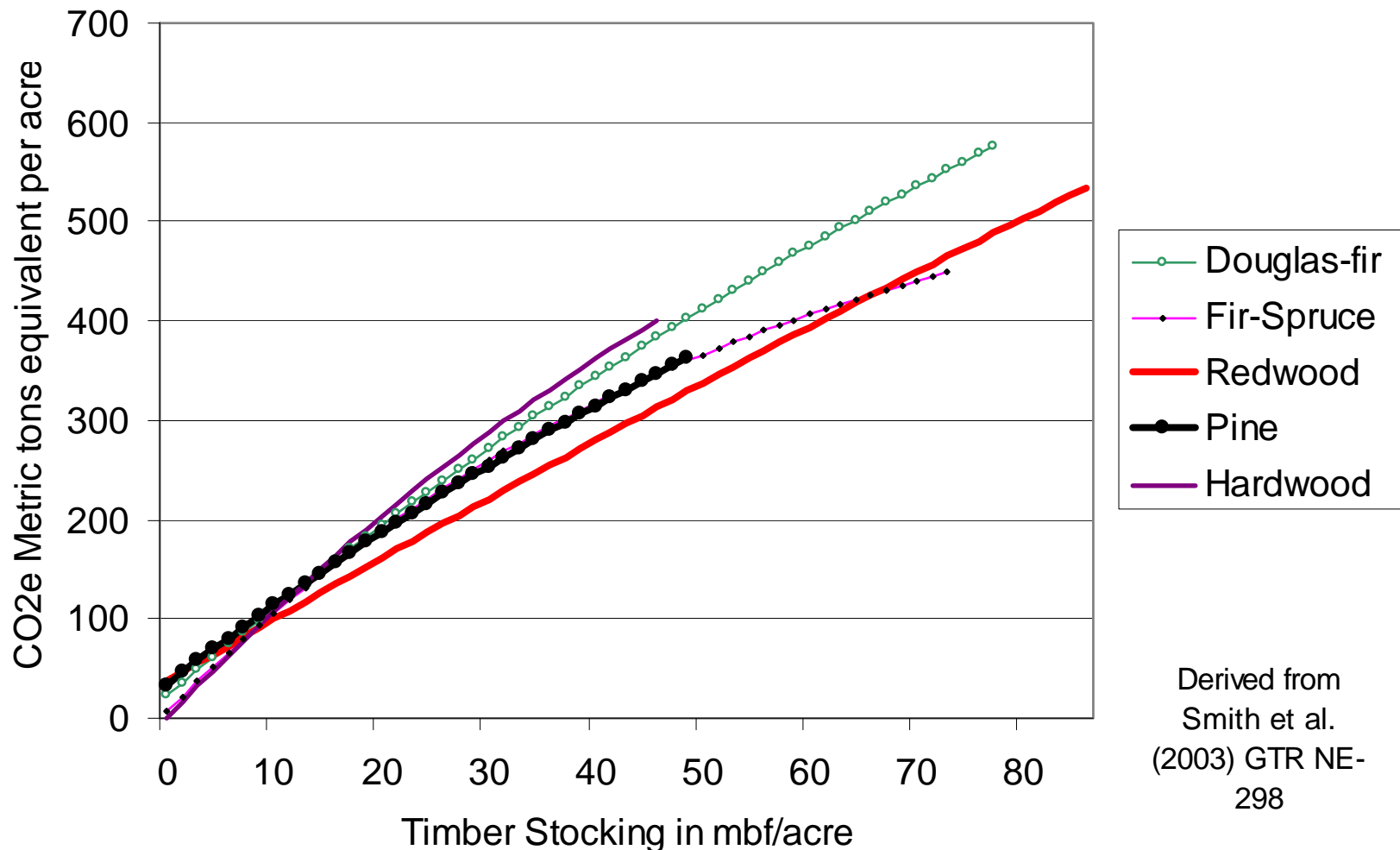
‘Net new’, or above baseline, forest carbon via

1. New planting of areas that will support forests
2. Faster growth of existing forests
 - Low – 0.25 mbf/ac/yr or 2 CO₂e ton/ac/yr
 - Medium – 0.5 mbf/ac/yr or 4 CO₂e ton/ac/yr
 - High – 1.0 mbf/ac/yr or 8 CO₂e ton/ac/yr
3. Reduced probability of climate-related risks
 - Fire (not all carbon is lost on every burned acre)
 - Insect and disease infestation and loss
 - Windthrow
4. Reduced regional conversion losses of trees

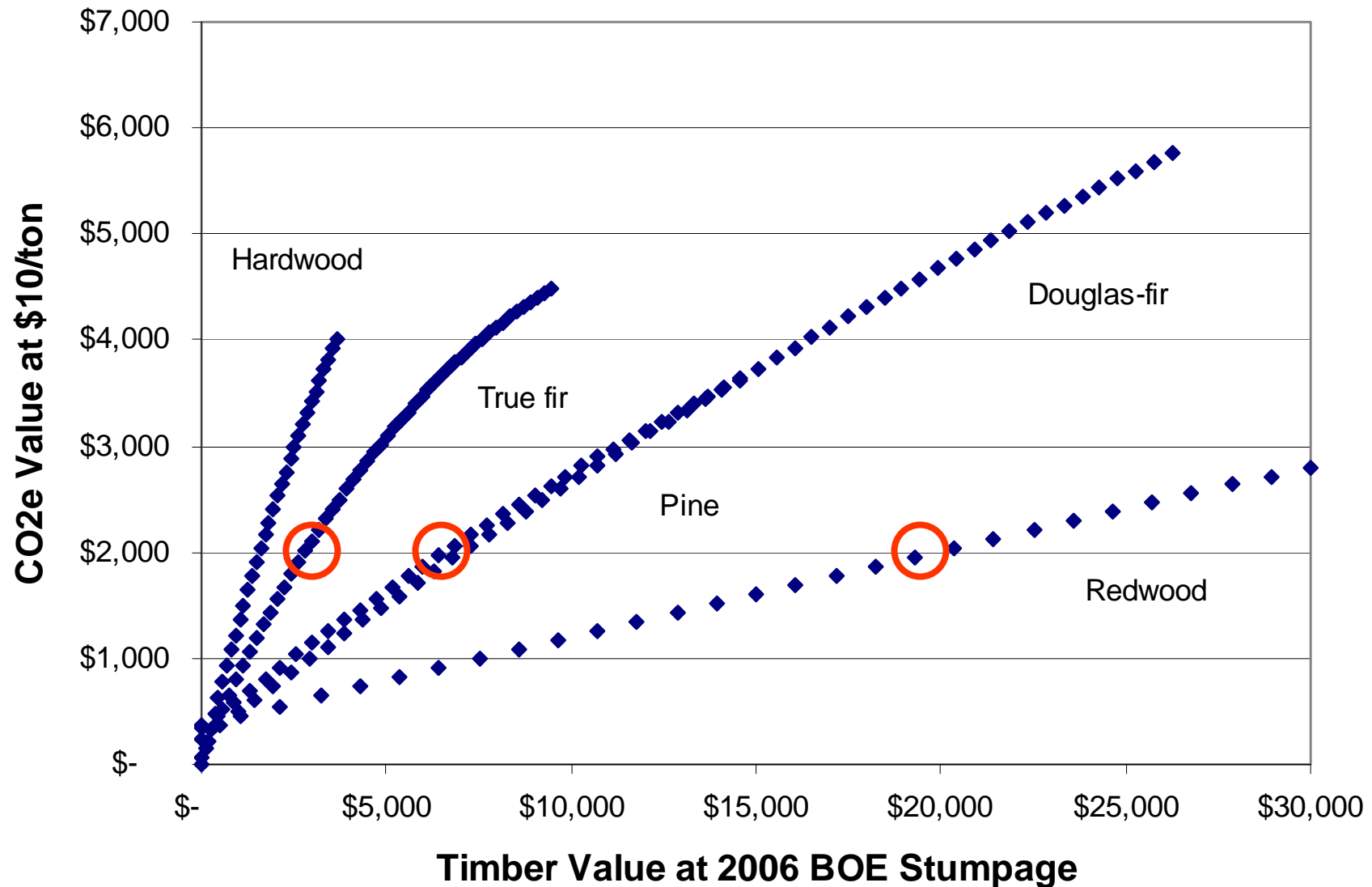


Conversion between forestry measurements (board feet) and metric units (tons of CO2 equivalent – CO2e)

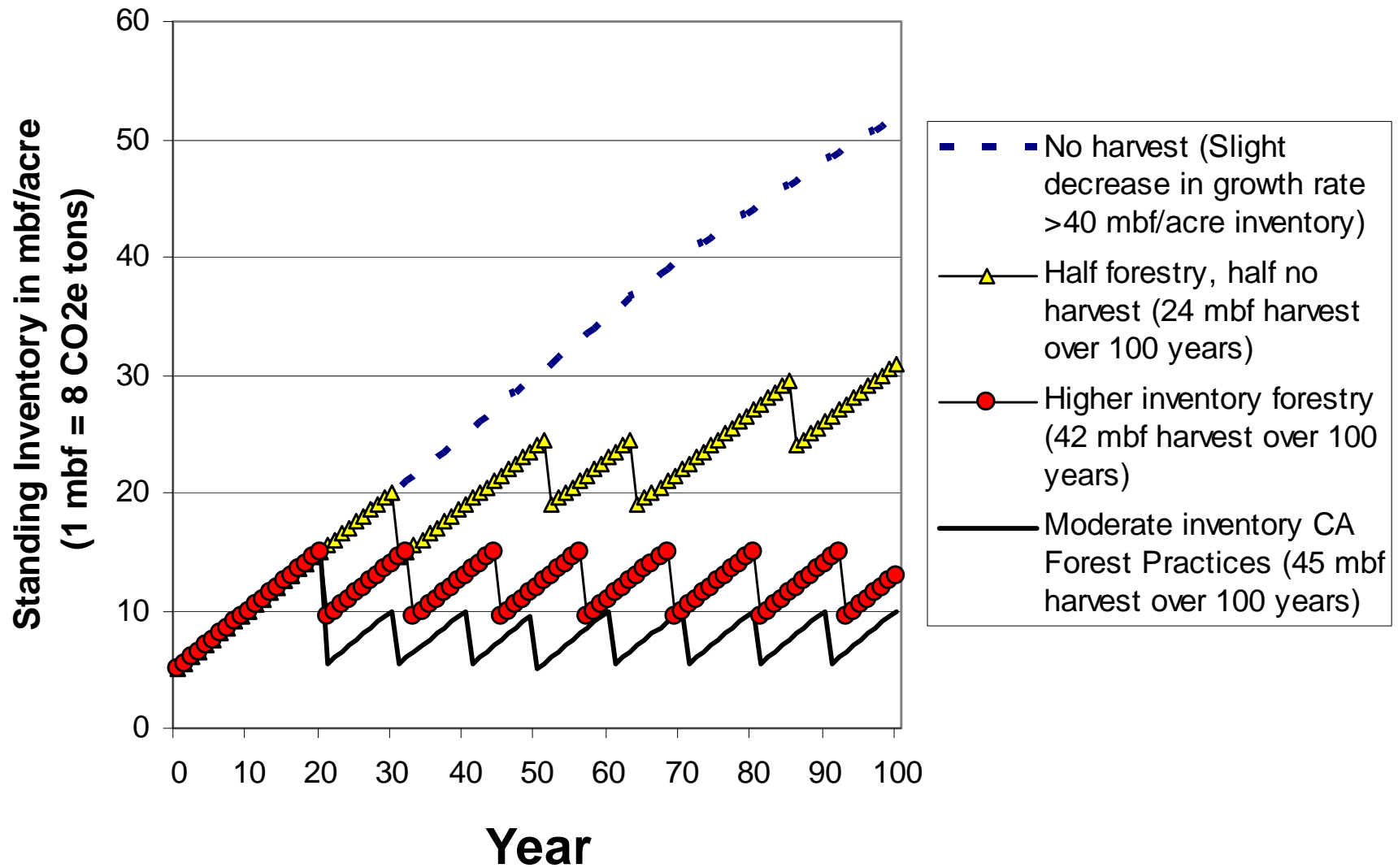
Timber Volume and CO2e Relationships for Major Forest Types in California (includes live and dead trees)



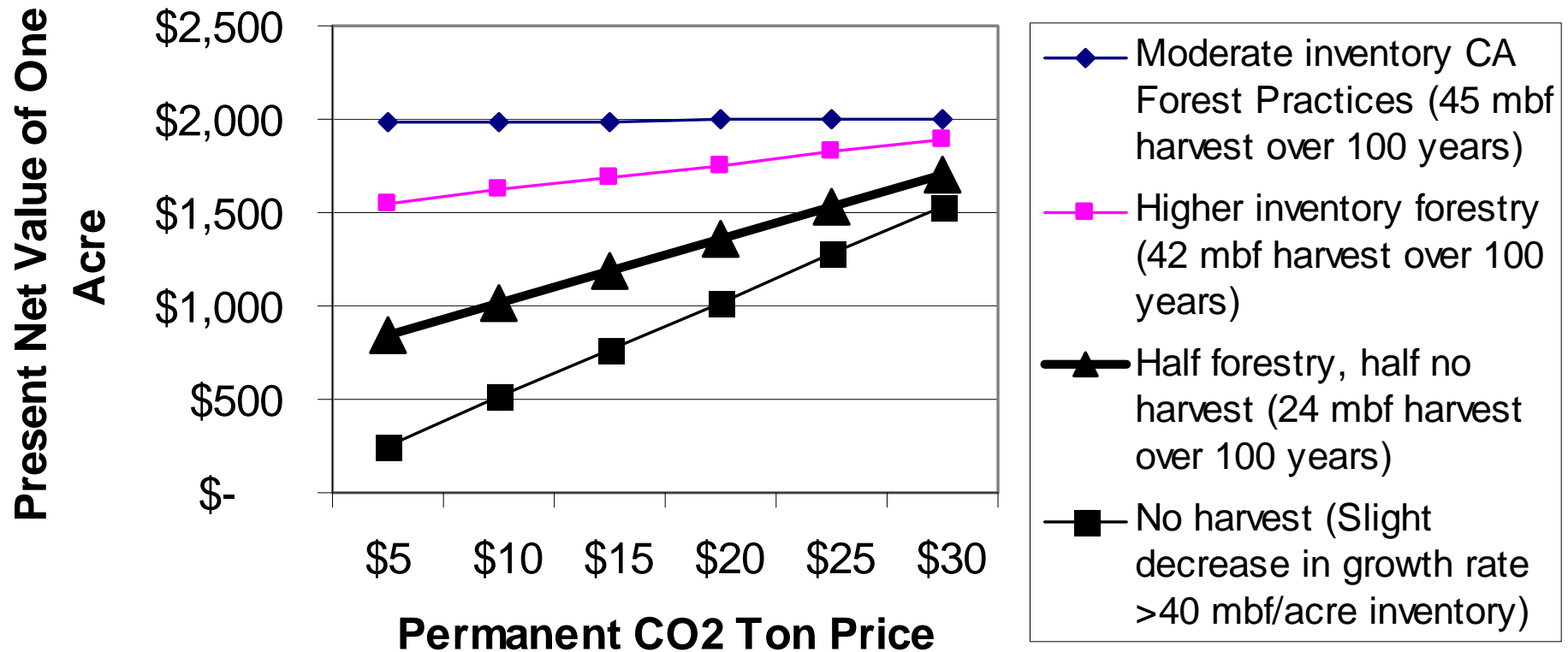
Timber Value v CO2e Value of One Acre of Timberland across a range of stocking densities



Standing Timber and CO2e Inventory for Four Management Regimes

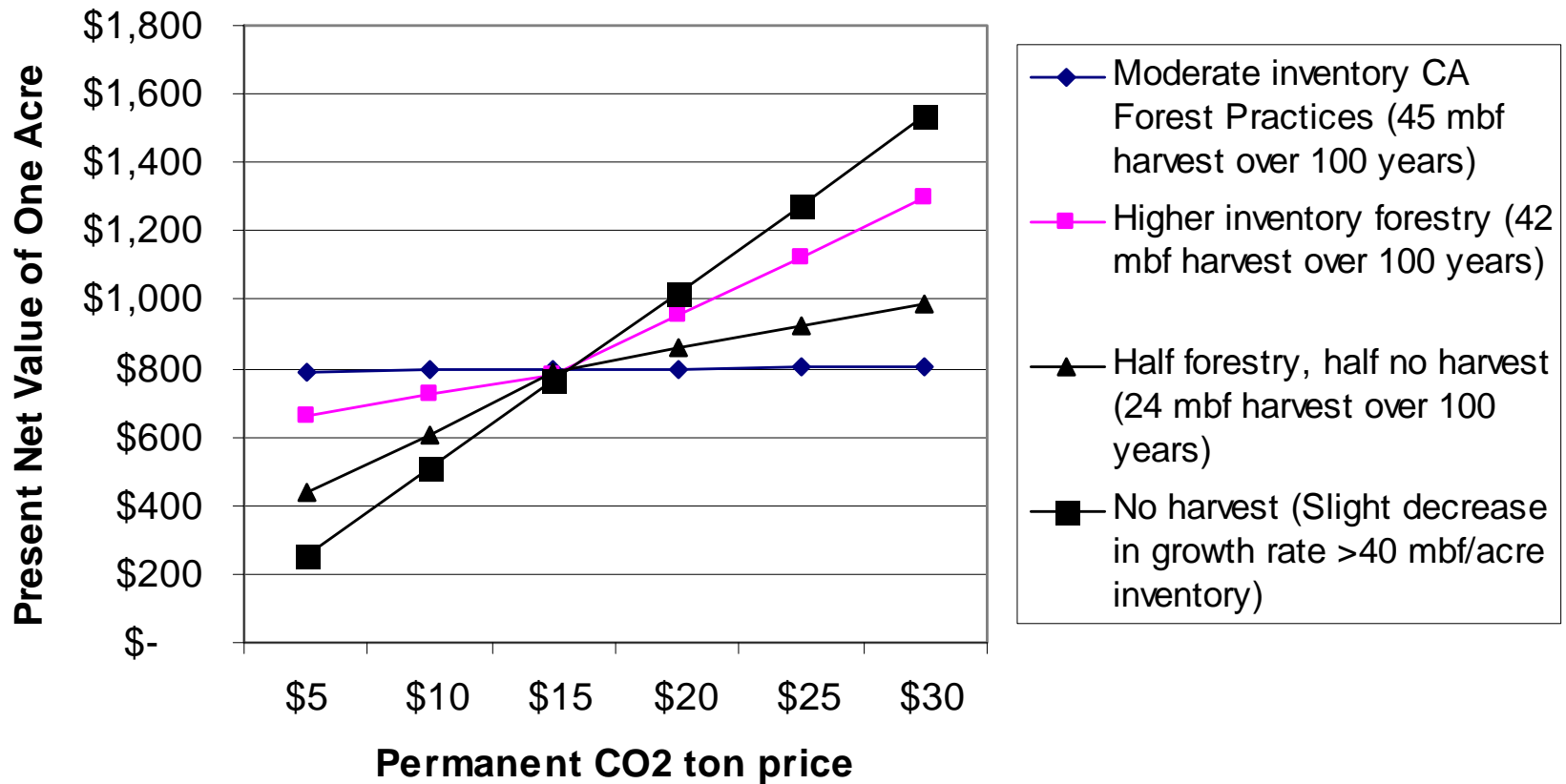


Present Net Value of 1 Acre under 4 Regimes: Statewide - 0.5 mbf/acre/yr, 2006 stumpage (\$327/mbf), various CO2e prices



Bottom Line – The average forest products in California have more financial and climate benefits as long-lived energy efficient building products than simply as stored carbon

Present Net Value of 1 Acre under 4 Regimes: True Fir forest - 0.5 mbf/ac/yr growth, \$130/mbf, and various CO2e payments



However, white fir values are much closer for products or carbon storage. This is similar to the financial rationale of 1600 acre Lummi Indian Tribe Project funded by the Climate Trust (Oregon)

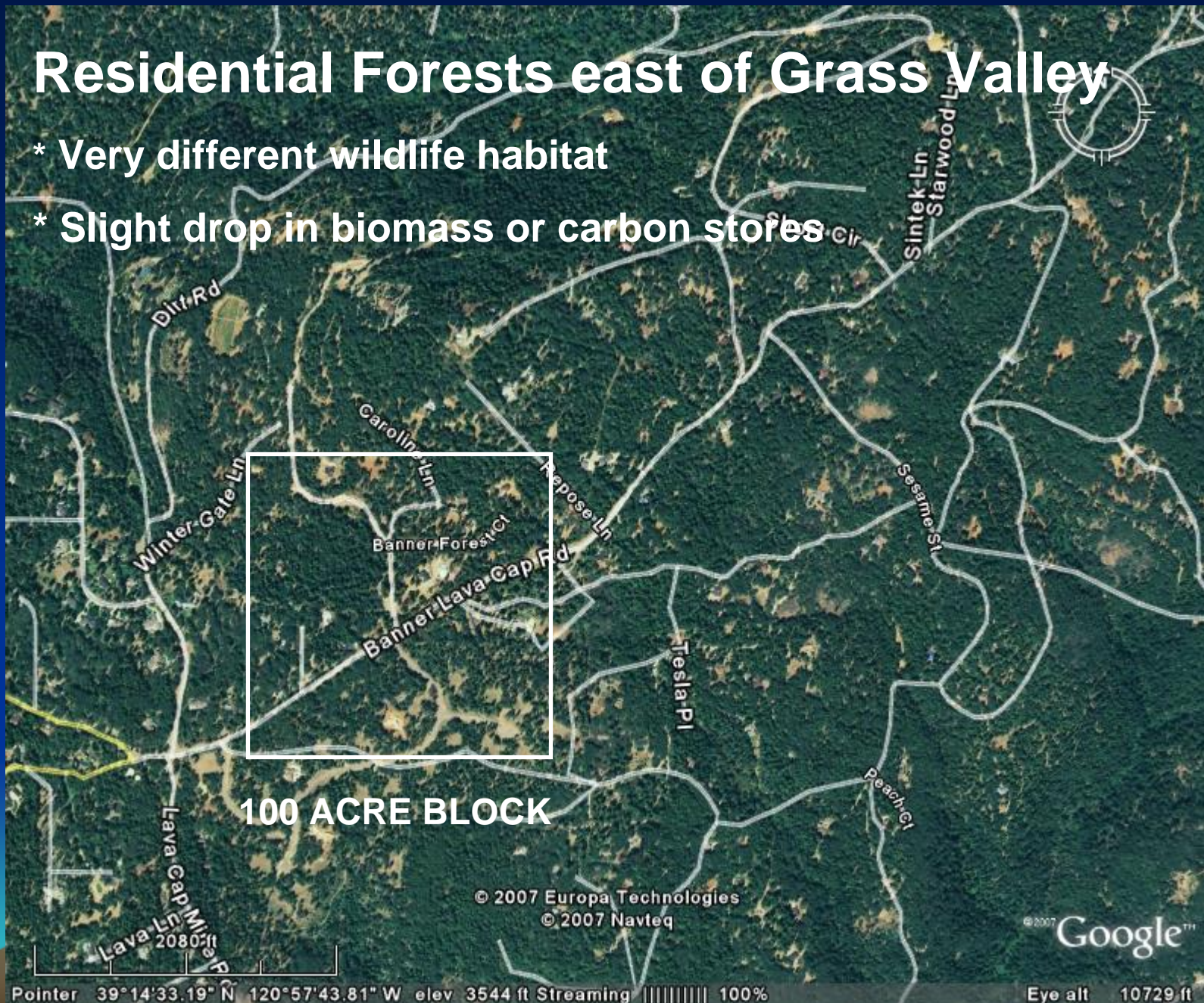
Potential Forest Carbon Loss from Rural Residential Development

- Forest conversion does create a loss of forest wildlife habitat but large forest lots keep most of their trees (and carbon)
- Carbon losses from immediate residential footprint on large lots (median- 10+ acres) are around 10% of wildlife habitat loss



Residential Forests east of Grass Valley

- * Very different wildlife habitat
- * Slight drop in biomass or carbon stores





People who buy forest parcels often only clear $\frac{1}{2}$ - 1 acre – because they like to live surrounded by trees



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Forest Parcels for Sale for Residential Development in May 2007

\$150 million for 12,000 acres

\$20 million for CO₂e value at \$10/ton

County	\$ / Acre	Parcels on MLS
Santa Cruz	\$24,500	15
Nevada	\$17,500	153
Humboldt	\$9,500	35
Plumas	\$6,600	47
Siskiyou	\$4,000	35

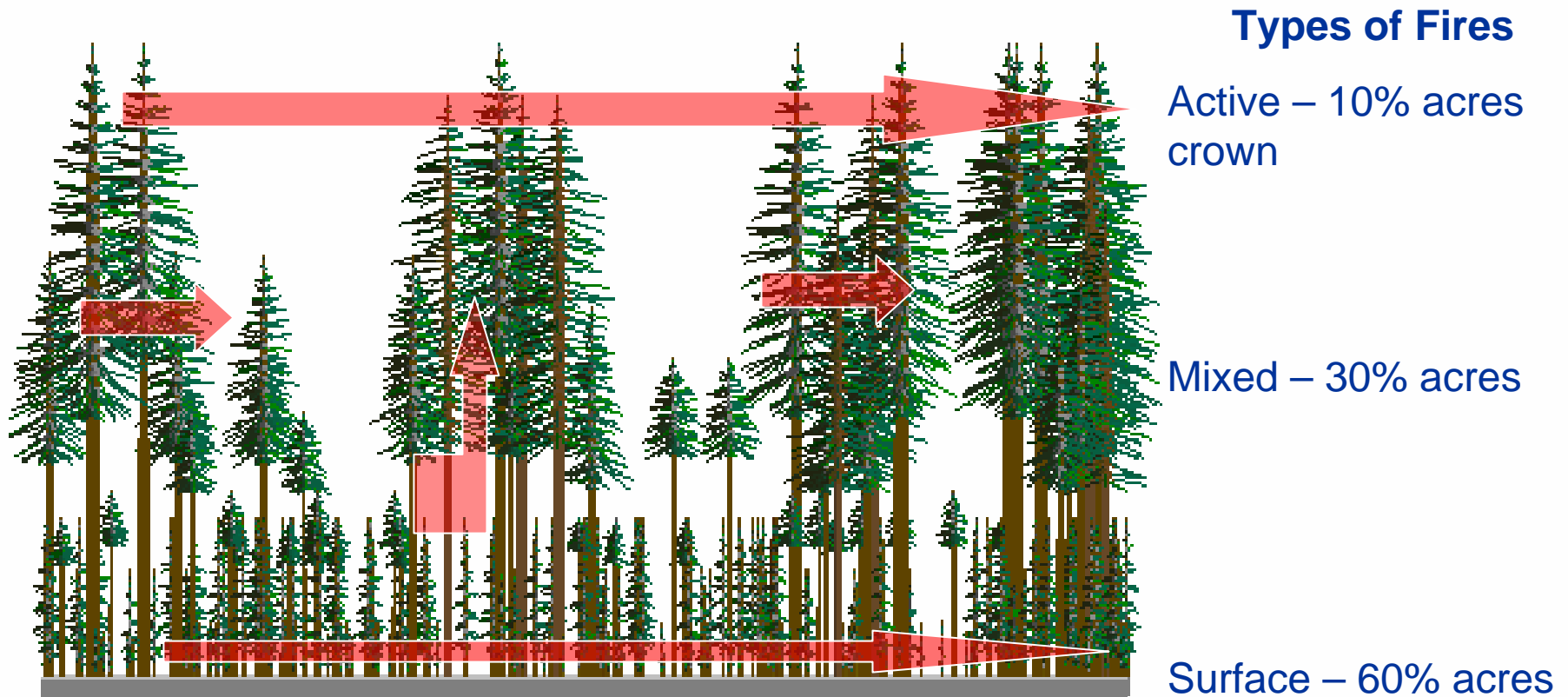
Source: Multiple Listing Service

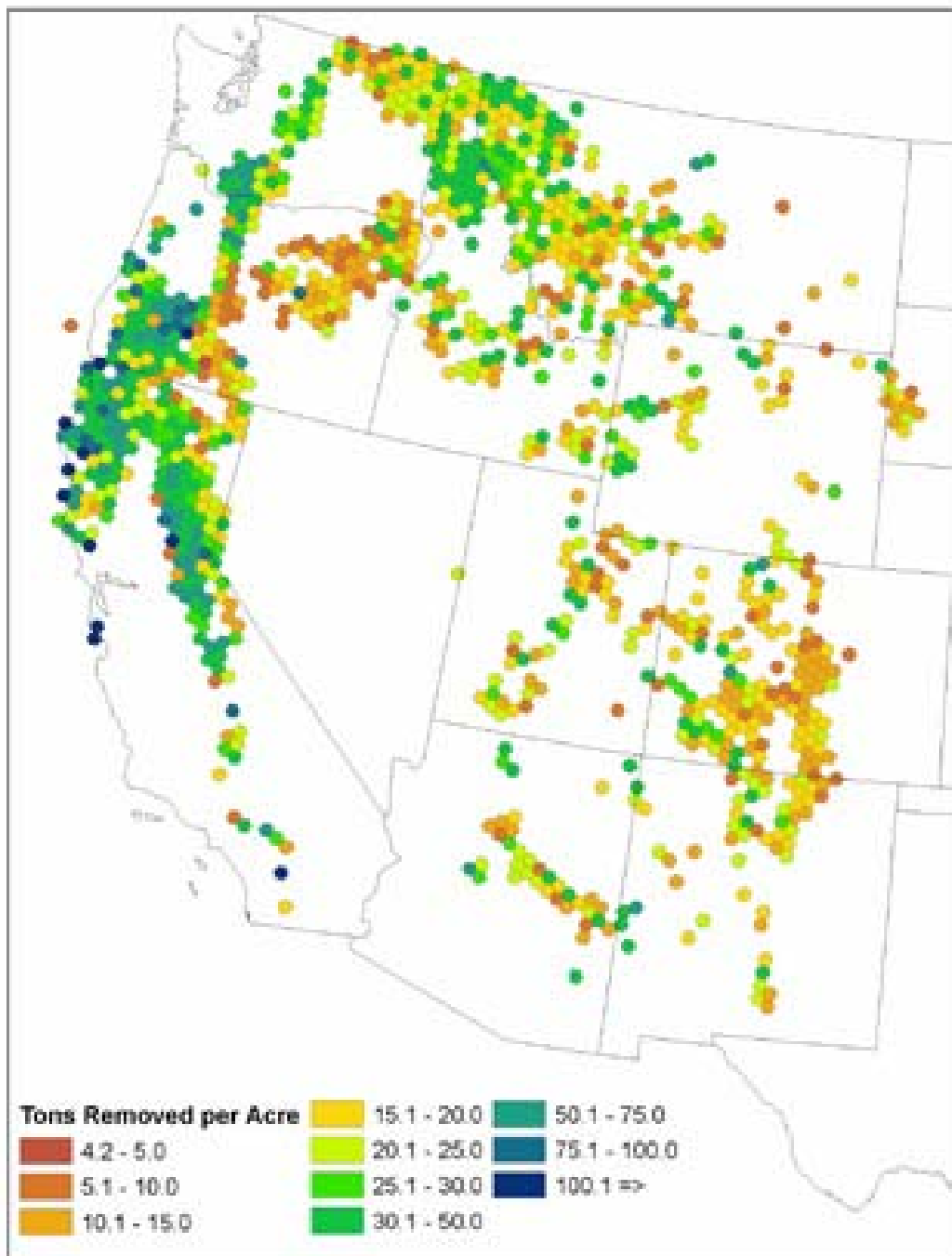
Increased Climate Vulnerability is probably a more significant risk now and will increase

- Hotter, drier, windier weather
- More high fire weather days
- Less available moisture per acre



Wildfire: All burnt acres are not the same in terms of carbon losses





USFS (Skog et al. 2006) report on fire risk reduction harvest potential – California has greatest risk, greatest fuel buildup, and greatest potential biomass yields/ac – key area to reduce risk and produce renewable energy

Conclusion

- State climate change policies influencing forestry are being developed in many different arenas
- California forests produce low-carbon products, are adding carbon, and can do more
- In-forest, in-products, and in-renewable energy components must all be considered
- Measuring 'net new' carbon storage in the forest, and the risks to those trees, is what foresters do already
- Landowners will make smart investments as CO₂e prices rise and if they don't lose too much value to commissions and regulatory costs



PROPOSED EARLY ACTIONS TO MITIGATE CLIMATE CHANGE IN CALIFORNIA (ARB 4/20/07)

- http://www.climatechange.ca.gov/climate_action_team/reports/2007-04-20_ARB_early_action_report.pdf
- 1. By regulations – ARB to consider forestry issues in 2007/2008
- 2. By ongoing governmental programs – Climate Action Team estimates being revised
- 3. By other governmental and market mechanisms – ARB Market Advisory Committee



Table 2: Group 2 – Additional GHG Reduction Measures

Underway or to be Initiated by ARB in 2007-2009 Period (p7)

- 2-6 Education Guidance/protocols for local governments to facilitate GHG emission reductions TBD
- 2-7 Education Guidance/protocols for businesses to facilitate GHG reductions TBD
- 2-9 Energy Efficiency Light-covered paving, cool roofs and shade trees TBD
- 2-10 Fire Suppression Replacement of high global warming potential (GWP) gases used in fire protection systems with alternate chemical(s) 0.1
- 2-11 Forestry Forestry protocol TBD



6/1/07 Market Advisory Cttee

- Recommendations
- Offsets should be allowed
- No geographic or quantitative limitation on offset credits (forestry outside of CA – ok)
- Can bank offsets for future use
- Can not borrow offsets from future period to meet current period target



Good examples from Oregon

- Good example of Offset Policies and Projects – Climate Trust (Oregon)
- http://www.climatetrust.org/offset_projects.php
- 75% of offsets are energy conservation and 25% are forestry related
- Annual carbon storage lease arrangements between farmers and energy utility
http://www.directseed.org/carbon_trading.htm



Intergovernmental Panel on Climate Change

- Summary for policy makers
- <http://www.ipcc.ch/SPM040507.pdf>
- Source of some of international charts in this presentation
- Thorough presentations in plain english



Upcoming Events

- ARB is committed to addressing the details of the forest-related “TBD”s in 2008.
- The June 1, 2007 report by the ARB’s Market Advisory Committee will be discussed at a public meeting on June 12, 2007 and promotes the use of offsets as part of a cost-effective and technological innovation driving strategy.
- http://www.climatechange.ca.gov/policies/market_advisory.html

